List of Tables

List of Figures

List of Appendices

2.2 Water Resources

The following section describes surface waters, wetlands, and groundwater resources within the Project Area.

2.2.1 Existing Conditions

2.2.1.1 Surface Waters

The Project Area is located within two water resource regions, the Chautauqua-Conneaut drainage basin (USGS Hydrologic Unit 04120101) and the Conewango drainage basin (USGS Hydrologic Unit 05010002). The majority of the Project Area lies within the Chautauqua-Conneaut drainage basin, which spans 874 square miles in New York, Ohio, and Pennsylvania. The southeastern portion of the Project Area lies within the Conewango drainage basin, which spans 888 square miles in Pennsylvania and New York.

Major water bodies in the Chautauqua-Conneaut drainage basin that are crossed by the Project Area include Upper and Lower Canadaway Creek, Crooked Brook, Hyde Creek, Scott Creek, Upper Walnut Creek, and a small portion of the West Branch Conewango Creek. Scott Creek, Hyde Creek, and the Lower Canadaway Creek and their tributaries drain the north and northwest portions of the Project Area. Upper Canadaway Creek and its tributaries drain the southwest portion of the Project Area. Upper Walnut Creek and its tributaries drain the eastern portion of the Project Area.

Major water bodies in the Conewango drainage basin that are crossed by the Project Area include the West Branch Conewango Creek and its tributaries, which drain the southeastern portion of the Project Area.

In general, surface water quality appears to be unimpaired throughout much of the Project Area[1] (NYSDEC 1998), though the Lower Canadaway Creek and its tributaries is categorized as a waterbody needing verification (NYSDEC 2006). The NYSDEC indicated that this waterbody may have water quality problems or impacts, but currently it lacks sufficient information to determine whether uses are restricted. Additionally, Upper Walnut Creek and its tributaries is categorized as a waterbody with minor impacts, where less severe water quality impacts are apparent, but uses are still considered fully supported. These waters correspond to waters listed as having stressed uses (NYSDEC 2006). The West Branch Conewango Creek and its minor tributaries are categorized as no known impacts and other waterbodies within the Project Area are categorized as un-assessed, because there is insufficient water quality information available to assess the support of designated uses for these segments. Agricultural runoff potential is low in the Chautauqua-Conneaut drainage basin and is moderate in the Conewango drainage basin (NYSDEC 1998). According to the Unified Watershed Assessment Report (NYSDEC 1998), the

[1] Waters within the Project do not appear on the Section 303(d) List of Impaired Waters (EPA, 2007); impaired surface waters were not identified by NYSDEC in its Unified Watershed Assessment Program (NYSDEC, 1998).

Chautauqua-Conneaut watershed has streams and lakes affected by acid deposition, harbors endangered species (discussed in Section 2.3 of this DEIS), and modifications to water flow were noted. According to the Unified Watershed Assessment Report (NYSDEC 1998), the Conewango watershed has fish and wildlife population levels below desired goals, harbors endangered species (discussed in Section 2.3 of this DEIS), and modifications to water flow were noted. However, both watersheds were assigned a Class II, indicating that these watersheds meet clean water and natural resources goals, including those which require action to sustain water quality.

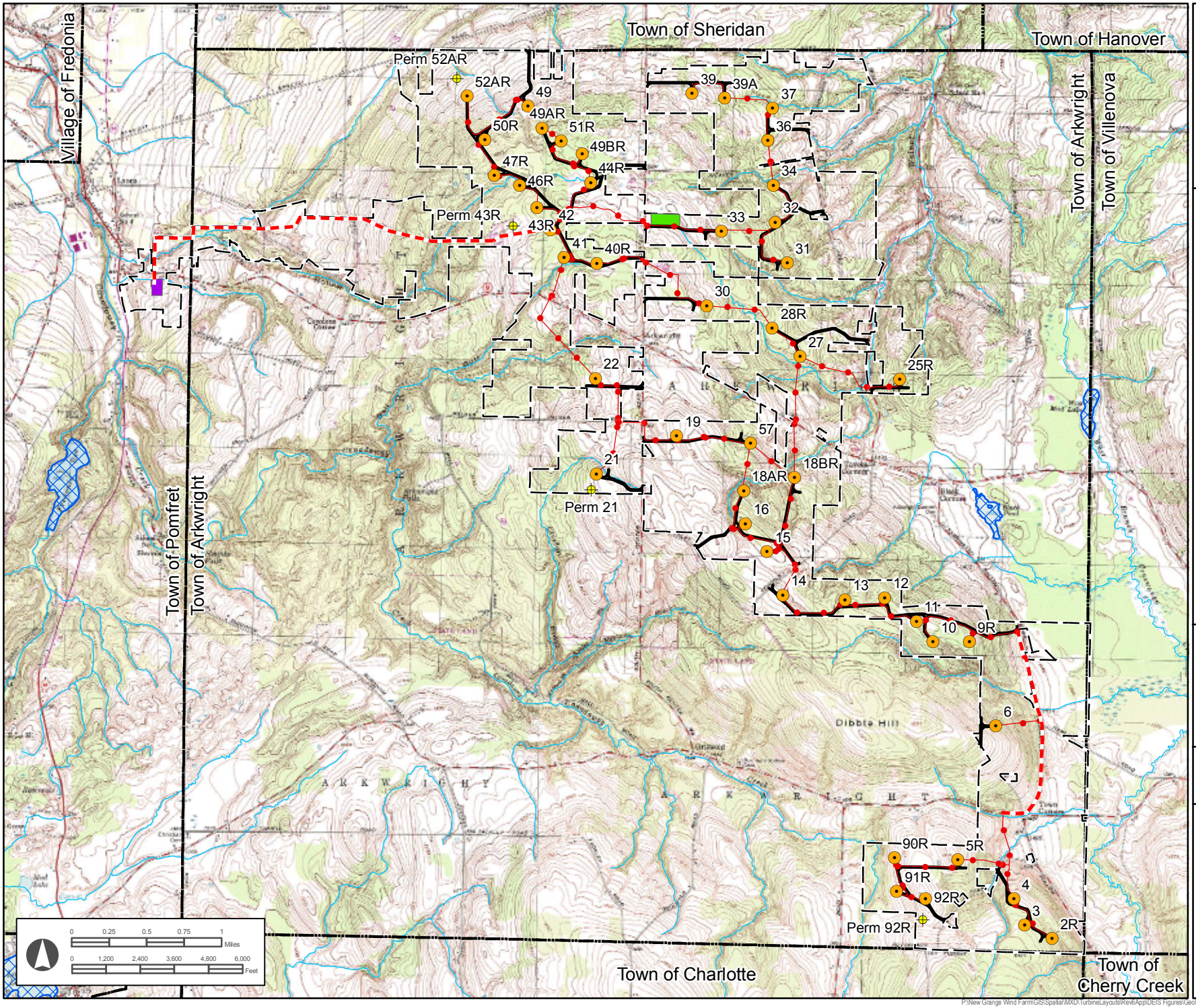
In Chautauqua County, surface waters account for 98 percent of recorded water use (USGS 2000). These waters are used for public water supply systems, industrial purposes, and thermoelectric purposes; when combined, these uses average 117.5 million gallons per day. Table 2.2-1 illustrates how surface and ground water is used within Chautauqua County.

Table 2.2-1. Year 2000 Water Usage in Chautauqua County, New York, as Reported by USGS

Type of Use	Surface Water (Million Gallons per Day)	Ground Water (Million Gallons per Day)
Public Supply	7.26	6.02
Domestic	0	2.14
Industrial	2.66	2.20
Thermoelectric	460.38	0

Policy to preserve and protect New York lakes, rivers, streams, and ponds is established under the Environmental Conservation Law (Article 15). New York designates surface freshwater resources based on best usage classifications and standards (6 NYCRR Part 701) or on wild, scenic, and recreational value (6 NYCRR Part 666). Wild, scenic and recreational rivers were not identified within the Project Site. Certain waters of the state are protected on the basis of their classification pursuant to 6 NYCRR Part 608, Protection of Waters. Protected waters include those with the classification and standards of: AA, AA(t), A, A(t), B, B(t), or C(t). State water quality classifications of waterbodies within the Project Area are Class AA, Class B, Class C, and Class C(t).

Protected streams, pursuant to 6 NYCRR Part 608, within the Project Area include Upper and Lower Canadaway Creek, Upper Walnut Creek, Scott Creek, Hyde Creek, Crooked Brook, and West Branch Conewango. These streams are shown in Figure 2.2-1. Six of these waters are designated as Class C, one as a Class B, and one as a Class AA. Table 2.2-2 lists each waterbody and its corresponding New York State Department of Environmental Conservation (NYSDEC) Identification (ID) and Class. The best usages of Class AA waters are a source of water supply for drinking, culinary or food processing purposes, primary and secondary contact recreation, and fishing. These waters are suitable for fish propagation and survival. The best usages of Class B waters are primary and secondary contact recreation and fishing.



Chautauqua County, New York State

- Permanent Met Towers
- Turbines
- Overhead Collection System
- Underground Collection System
- Access Roads
- Laydown Yard
- Substation
- Wind Overlay Zone
- Town Boundary
- NYSDEC Surface Water
- NYSDEC Streams

SOURCE:
SOIL DATA
NRCS SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE

TOPO DATA
USGS 7.5 MINUTE QUADRANGLES
DUNKIRK, 1978; FORESTVILLE, 1978; CASSADAGA, 1978; HAMLET, 1978

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NEW GRANGE WIND FARM

CHAUTAUQUA COUNTY, NEW YORK

FIGURE 2.2-1
SURFACE WATERBODIES IN THE PROJECT AREA

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These waters are suitable for fish propagation and survival. Classification C is for waters supporting fisheries and suitable for non-contact activities. A waterbody with a standard of (t) indicates that it may support a trout population. In addition, small lakes and ponds with a surface area of 10 acres of less, located within the course of a stream, are considered to be part of a stream and subject to corresponding regulations.

Table 2.2-2. Surface Waters Within the Project Area

Stream Name	NYSDEC ID	NYSDEC Class
Canadaway Creek, Lower (and tribs.)	Ont 158..E-37	B
Canadaway Crek, Upper (and tribs.)	Ont 158..E-37	C(t)
Crooked Brook (and tribs.)	Ont 158..E-36	C
Hyde Creek (and tribs.)	Ont 158..E-34	C
Scott Creek (and tribs.)	Ont 158..E-32	C
Walnut Creek, Upper (and tribs.)	Ont 158..E-25-1	C(t)
West Branch Conewango (and minor tribs.)	Pa-63-44	AA, C(t), C

2.2.1.2 Wetlands

Wetlands provide critical habitat to a variety of plants and animals, which are often dependent upon the attributes of wetland ecosystems. These areas are typically abundant with vegetation that offers food, nesting substrates, and essential cover for numerous species during breeding seasons, migration, and winter months. In addition to wildlife value, wetlands offer hydrological benefits such as water quality improvement, floodwater retention, and erosion control. Water quality is improved through the removal and retention of nutrients, the processing of organic and chemical wastes, and the reduction of sediment load. During flood periods, wetlands act to alleviate rising storm waters by serving as temporary storage areas and protecting downstream areas from flood damage. Also, because wetlands serve as buffers between land and water, they significantly decrease stream-bank and shoreline erosion. Alteration or destruction of wetlands may result in a decline in downstream water quality or in adjacent lakes. In addition, wetlands have a recreational significance as they contribute to the aesthetic value of the landscape, as well as provide habitat to numerous game species of fish and wildlife.

In New York, impacts to wetlands are regulated at the state and federal level. Freshwater wetlands that measure 12.4 acres or greater in size, or smaller wetlands of unusual local importance, are regulated by Article 24 of the New York State Environmental Conservation Law. An adjacent buffer area that extends 100 feet from the wetland boundary is also regulated under Article 24 to further protect the wetland. A freshwater wetland is ranked into one of four classes according to its ability to perform wetland functions and provide wetland benefits. Class 1 wetlands have the highest rank, and the ranking descends through Classes 2, 3, and 4. Disturbance to state-regulated wetlands would require a permit from the NYSDEC. Waterbodies and wetlands that have an apparent hydrologic connection to waters of the United States or

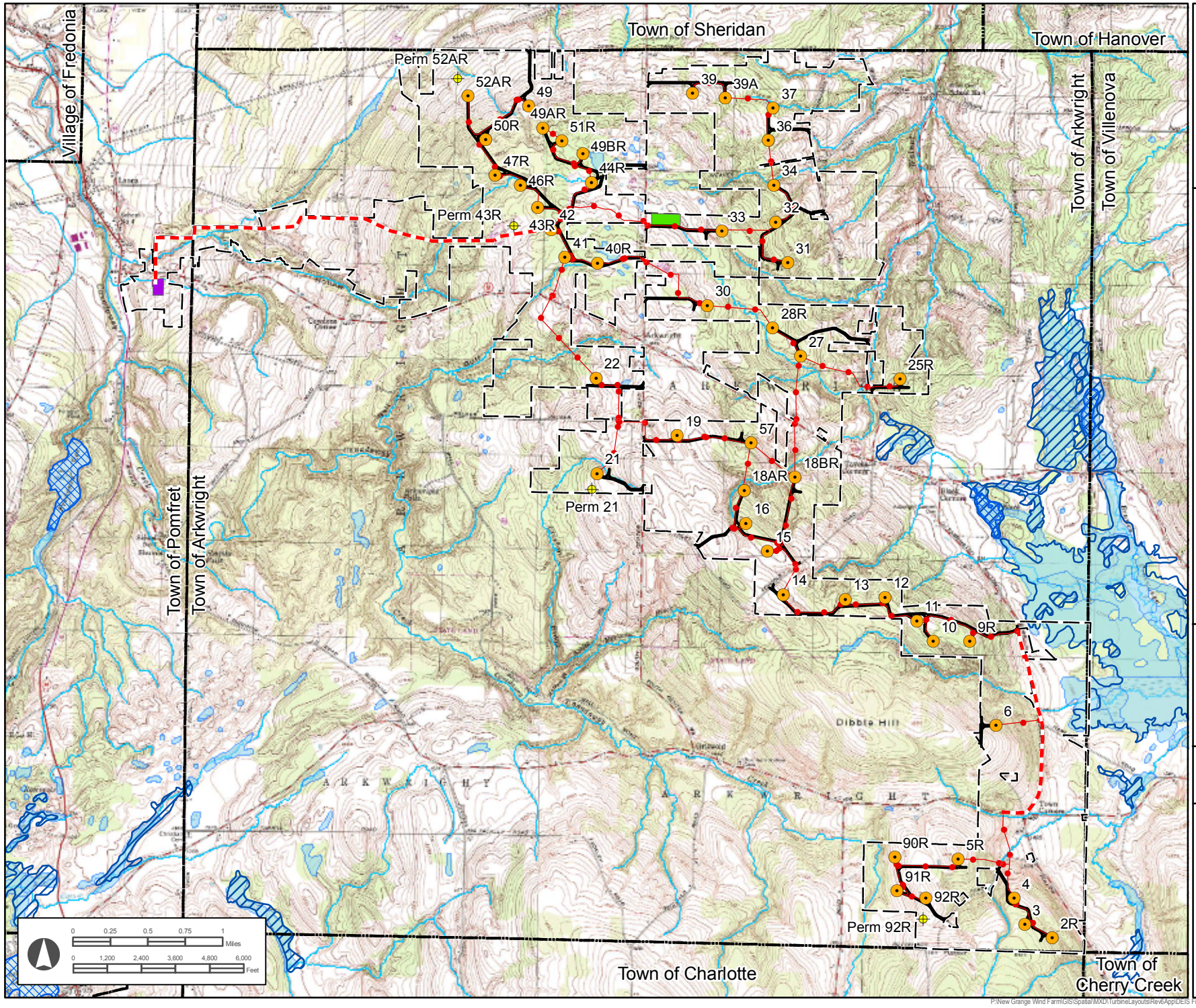
significantly affect the chemical, physical, and biological integrity of downstream traditional navigable waters are regulated by the United States Army Corps of Engineers (USACE). Activities that would introduce fill or dredged material into waters of the United States, which includes wetlands, are regulated at the federal level by Section 404 of the Clean Water Act. The Section 404 permit program is administered by the USACE.

Of 19,100 acres within the extent of the Project Area (including non-participating parcels of land), 1.5 percent of the area is covered by mapped wetlands. Review of the NYSDEC freshwater wetland maps indicate that two state-regulated forested wetlands totaling 74.0 acres occur within the Project Area. None of these wetlands or adjacent upland buffers would be crossed by the footprint of the turbine layout. A total of 205 wetlands mapped by National Wetland Inventory (NWI) occur within the Project Area, totaling 213.83 acres. Of these wetlands, 81.17 acres occur as palustrine forested wetlands (PFO), 68.98 acres occur as freshwater ponds (PUB), 54.67 acres occur as palustrine scrub-shrub wetlands (PSS), and only 9.0 acres occur as palustrine emergent wetlands (PEM). The NYSDEC and NWI mapped wetlands located within the Project Area are shown in Figure 2.2-2. A summary of the NYSDEC and NWI wetlands that occur in the Project Area are listed in Table 2.2-3.

Table 2.2-3. Mapped Wetlands Located in the Project Area

Mapped Wetland	NYSDEC Data (if applicable)	Cover Type a/	Wetland Acreage within Project Area
NYSDEC	FO-1, Class 1	PSS1E/PFO1E/PEM5eb/PUBH	43.9
NYSDEC	FO-10, Class 2	PFO1E/PSS1E	30.0
NWI	-	PEM5E	7.0
NWI	-	PEM5Eb	2.0
NWI	-	PFO1C	2.9
NWI	-	PFO1E	76.7
NWI	-	PFO5F	1.6
NWI	-	PSS1/EM5E	9.2
NWI	-	PSS1A	3.1
NWI	-	PSS1C	12.5
NWI	-	PSS1E	29.8
NWI	-	PUBFx	0.3
NWI	-	PUBH	10.8
NWI	-	PUBHh	11.7
NWI	-	PUBHx	46.2

a/ Note that acreages from 205 total NWI wetlands were summarized by cover type. Cover types listed in this table are described in Cowardin et al. 1979). PFO1: palustrine forested broadleaf deciduous wetland; PFO5: palustrine forested dead; PSS1: palustrine scrub-shrub deciduous wetland; PEM5: palustrine emergent broadleaved nonpersistent wetland; PUB: palustrine unconsolidated bottom.



SOURCE:
SOIL DATA
NRCS SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE

TOPO DATA
USGS 7.5 MINUTE QUADRANGLES
DUNKIRK, 1978; FORESTVILLE, 1978;
CASSADAGA, 1978; HAMLET, 1978

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CHAUTAUQUA COUNTY, NEW YORK

FIGURE 2.2-2
MAPPED WETLANDS
IN THE PROJECT AREA

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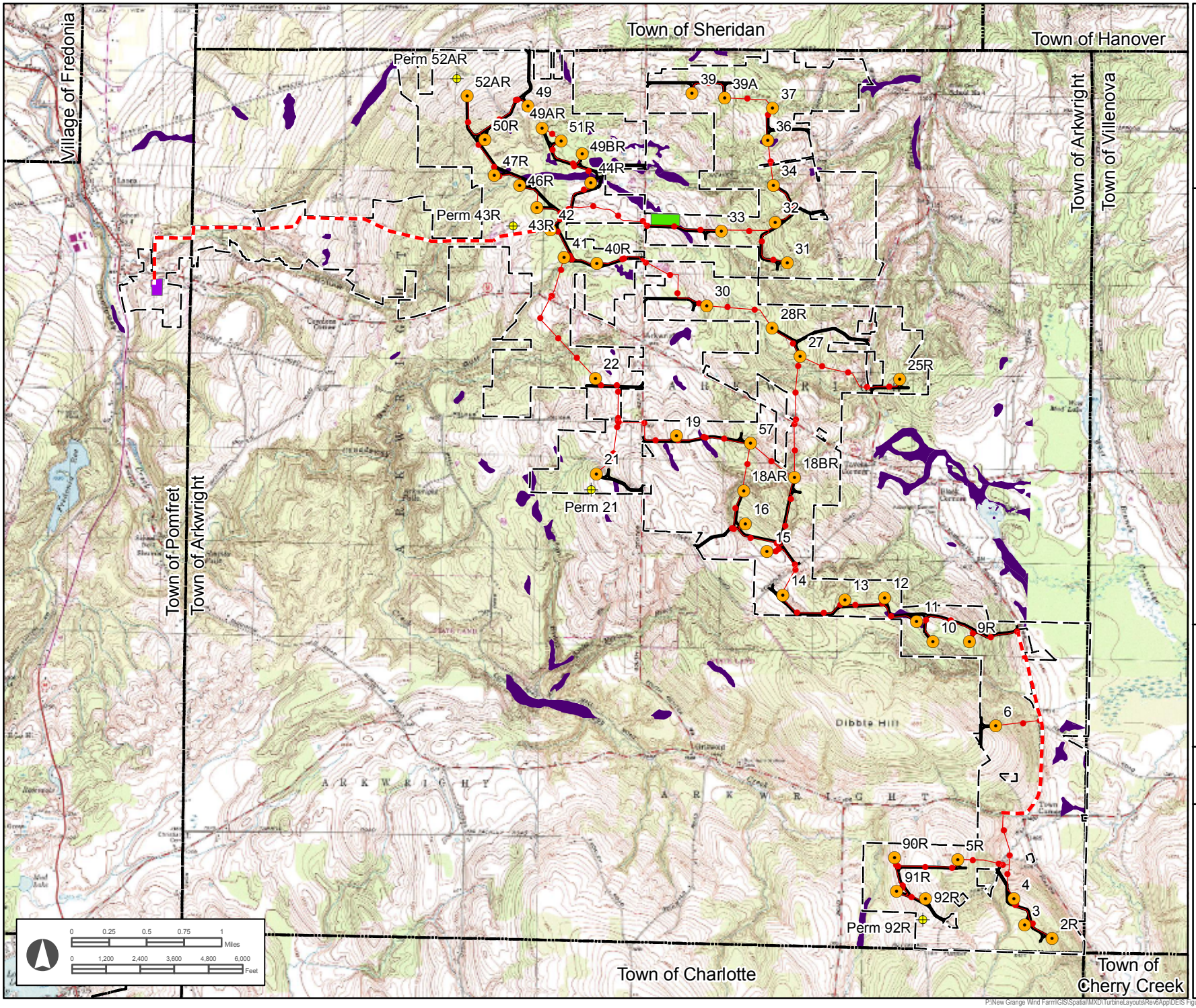
A review of the National Hydric Soil List for Chautauqua County, New York indicates that portions of the Project Site contain hydric soils, as determined by the Natural Resources Conservation Service (NRCS 2007). Hydric soils are poorly or very poorly drained and their presence indicates the likely occurrence of wetlands. Nine hydric soils occur in the Project Area, as listed in Table 2.2-4. These soils are found in depressions, marshes, and flood plains throughout the Project Area, and often correlate with the locations of stream channels, NYSDEC mapped wetlands, and NWI mapped wetlands. Figure 2.2-3 shows locations of hydric soils within the Project Area. In addition, there are 26 soil types that occur in the Project Area that have the potential for hydric soil inclusions. Based on the mapped presence of hydric soils, or soils with hydric inclusions in the Project, NYSDEC and NWI maps likely underestimate the presence of wetlands in the Project Area.

Table 2.2-4. Hydric Soils within the Project Area

Map Unit Name and Map Symbol	Percent slopes	Drainage Class	Comments a/
Alden mucky silt loam (Ad)	0-3	Very poorly drained	Found in low areas and depressions. Common in headwater areas of streams.
Ashville silt loam (As)	0-3	Poorly drained	Found along drainage ways, on broad flats, and on small depressions along glaciated uplands.
Canadice silty loam (Ca)	0-3	Poorly drained	Found in depressions on lake plains and in the major valleys.
Canandaigua silt loam, loamy substratum (Cb)	0-3	Poorly drained	Found in flat areas and to a lesser extent in the major valleys.
Canandaigua mucky silt loam (Cc)	0-3	Poorly drained	Found in low areas in the major valleys and to a lesser extent in depressions on lake plains.
Carlisle muck (Ce)	0-3	Very poorly drained	Organic soil found in bogs and swamps on the lowest parts of the landscape. Mostly adjacent to lakes.
Fluvaquents-Udifluvents complex, frequently flooded (Fe)	0-3	Moderately, Somewhat or very poorly drained (fluvaquents); Moderately well drained (Udifluvents)	Located in areas of unconsolidated alluvium deposited in long narrow strips along secondary streams.
Getzville silt loam (Ge)	<2	Poorly or very poorly drained	Found mainly on the lowland plains in the wide major valleys.
Halsey mucky silt loam (Ha)	0-3	Very poorly drained	Found in low areas and depressions on outwash plains.
Henrietta muck (Hm)	0-3	Very poorly drained	Found in basinlike areas and in low, swampy areas that are wet most of the year.

a/ USDA 1994



Chautauqua County, New York State

- Permanent Met Towers
- Turbines
- Overhead Collection System
- Underground Collection System
- Access Roads
- Laydown Yard
- Substation
- Wind Overlay Zone
- Town Boundary
- Hydric Soils

SOURCE:
SOIL DATA
NRCS SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE

TOPO DATA
USGS 7.5 MINUTE QUADRANGLES
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NEW GRANGE WIND FARM

CHAUTAUQUA COUNTY, NEW YORK

FIGURE 2.2-3
HYDRIC SOILS
IN THE PROJECT AREA

NEW GRANGE WIND FARM LLC
FEBRUARY 2008

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Wetlands were surveyed using a multi-staged effort which included a desktop review of all sites, formal wetland delineation at some (13) turbine locations, and reconnaissance wetland field observations at 42 potential turbine sites within the Project Area during October and November 2007 (Appendix D1 and D2). This phased approach facilitated turbine layout revisions which were based on minimizing impacts to sensitive resources and other constraints. Wetlands within all turbine locations, access roads, transmission lines, and other workspaces and facilities will be delineated in accordance with the methods outlined for routine, on-site determinations (Environmental Laboratory 1987) in 2008 prior to the submittal of the FEIS.

2.2.1.3 Groundwater

The predominant source of drinking water in Chautauqua County is from surface water; however, groundwater is likely the major water source in the Project Area and surrounding areas. Groundwater in Chautauqua County is mostly used for public water supply, but is also used for the purposes of domestic uses and industry (Table 2.2-1). Groundwater quality does not appear to be affected by pollution in Chautauqua County (Chautauqua County Department of Health, 2005). Based on personal communication with Bill Borea, Assistant Director of Environmental Health Services of Chautauqua County, the northerly adjacent town of Forestville derives its water from sources located within the Town of Arkwright. A request has been submitted to the Chautauqua County Department of Health, Environmental Health Services to obtain the location of groundwater wells, aquifers and potable water sources within the Project Area. The location of public water supply groundwater wells will be included in the FEIS.

The Project Area is located on the Southern New York section of the Allegheny Plateau within the Great Lakes Drainage Basin. Most potable groundwater is found in thick unconsolidated deposits in the valleys. According to United States Geological Service (USGS) maps, there does not appear to be any sandstone, carbonate or Mesozoic basin aquifers. The nearest sole source aquifer (SSA) is the Cattaraugus Creek, in Wyoming and Allegany Counties.

2.2.2 Anticipated Impacts

2.2.2.1 Construction

Through an iterative process, the Project layout was created using information about the locations of sensitive resources in conjunction with Project constraints, as described in Section 1.0. The result is a facility layout that avoids or minimizes impact to the surrounding landscape. As part of this effort, surface waterbody and wetland presence were assessed through field reconnaissance wetland observations (Appendix D1), on-site wetlands delineation (Appendix D2) for a subset of turbine sites in late 2007, and desktop evaluations of recent aerial photography, NYSDEC mapped surface water information, NWI maps, USGS topographic quadrangles, and NRCS soils information. Results of the field reconnaissance, wetlands delineation, and desktop evaluations were used to identify sensitive wetland and surface water resources associated with the layout that could be affected by construction and operation of the

Project. Subsequent modifications to the facility layout reduced the potential to affect sensitive resources. Surface waterbodies and wetlands that occur within the turbine sites that were not delineated in 2007 will be assessed in 2008 during on-site wetlands delineation. The results of these studies will be included in the FEIS.

Surface Waters and Wetlands

During the construction of the Project, direct and indirect impacts to wetlands and waterbodies may result from such activities as developing access roads, improving local public roads, trenching electrical collection lines, creating temporary workspaces around turbine locations, and erecting poles for aboveground transmission. Direct impacts may include excavating, grading, direct placement of fill in wetlands, and vegetation clearing associated with developing workspaces and access roads. Creating temporary workspaces would result in temporary effects to wetlands, whereas developing access roads would result in permanent effects to wetlands. Installing buried electrical collection systems would cause temporary effects to wetlands and streams by disturbing the soils during trenching and backfill. Forested wetlands crossed by the collection system would be permanently affected through conversion to non-forested wetlands by vegetation clearing activities during the operational phase of the Project. Indirect impacts may occur due to increased erosion and sedimentation resulting from soil disturbance and vegetation clearing that are necessary to install Project components. Precipitation events could indirectly affect water quality throughout the Project Area by introducing loose fines disturbed during construction into nearby surface waters.

As discussed in Section 2.2.2.1, the presence of wetlands and streams within the Project turbine layouts was assessed during reconnaissance-level field observations and on-site wetlands delineation in October and November of 2007. These field inventories and desktop reviews were compared against the facility layout to identify sensitive resources that could be affected through construction and operation of the Project. Wetland identification surveys for the turbines sites, access roads, and utility corridors will be completed during 2008.

Based on the results of the field reconnaissance observations and wetlands delineation, wetland cover classes included PEM, PSS, and PFO within the Project turbine layouts. Two of these wetlands were NWI wetlands. Results of the field observations and wetlands delineation indicated that 85 percent of the turbine sites were forested, most commonly with red maple (*Acer rubrum*), American beech (*Fagus grandifolia*), and eastern hemlock (*Tsuga canadensis*). The NWI maps also indicated palustrine forested, broad-leaved deciduous wetlands (PFO1), palustrine scrub-shrub deciduous wetlands (PSS1), and palustrine unconsolidated bottom wetlands (PUB) are the prevalent wetland types in the Project Area. The Wetland Field Observations Report (Tetra Tech – NEA, 2007a) and the Wetland Delineation Report (Tetra Tech – NEA, 2007b) provide details about the character and occurrence of wetlands within the turbine layout, and are presented in Appendix D1 and D2, respectively.

Based on the proposed layout, construction of the Project may affect 68 wetlands (some crossed more than once), as well as 33 streams (some crossed more than once). Wetlands that would be crossed by the Project are listed by facility in Table 2.2-5. These effects would involve both temporary and permanent placement of fill to develop Project access roads, temporary placement of fill in turbine work spaces, and temporary soil disturbance associated with the installation of the underground collection system. The Project may result in 13.56 acres of temporary disturbance and 1.63 acres of permanent disturbance to federal regulated wetlands, as summarized in Table 2.2-6. Streams that would be crossed by the Project are listed by facility in Table 2.2-6. The Project may result in 1.33 miles (7919.37 linear feet) of temporary stream disturbance and 0.17 miles (918.35 linear feet) of permanent stream disturbance.

The conversion of forested wetlands to non-forested wetlands constitutes a permanent change in wetland vegetation composition under NYSDEC regulations. While this conversion from one cover class to another does not constitute a net loss of wetlands, it may alter the structure and function of these wetland habitats. Therefore, impacts to state-regulated forested wetlands that are converted to either emergent or scrub-shrub wetlands are considered permanent impacts Construction of the Project would permanently convert 1.49 acres of forested wetlands to non-forested wetland cover classes.

Construction of wind turbine foundations would require the permanent conversion of lands within a 50-foot radius of the turbine site for Project facilities, and temporary disturbance within a 250-foot radius. Because Project siting avoided placement of turbines within 100 feet of wetlands and surface waters, these sensitive resources would not be subject to permanent effects. Forested wetlands that are adjacent to wind turbines would not be converted to other wetland cover types.

Construction of access roads would require temporary disturbance of vegetation within a 100-foot wide corridor, and permanent conversion of lands within a 50-foot wide corridor. The electrical collection system would occur as both underground and overhead facility components. The underground collection system would require vegetation clearing of a 75-foot wide corridor, with an operational corridor width of 45 feet. Wherever feasible, the underground collection system would be installed in the alignments of access roads to minimize disturbance to wetlands and waterbodies. In contrast, the overhead collection system would require vegetation clearing within a 150-foot wide corridor that would be periodically maintained during the operational phase. Surface waterbodies and wetlands associated with access roads, the electrical collection system, substations, switchyards, laydown yards, and the O&M building will be identified during surveys in 2008.

Table 2.2-5. Wetlands Crossed by the Project

Facility	Turbine ID a/	Survey Type b/	Forested / Non-Forested Cover Type	Temporary Soil Disturbance (ac)	Permanent Soil Disturbance (ac)
Access Roads					
	Turbine 2	Field Observation	Forested	0.01	0.01
	Turbine 2R	Field Observation	Forested	0	0.00
	Turbine 3	Field Observation	Forested	0.04	0.04
	TB4-W1	Delineated	Non-Forested	0.04	0.04
	TB11-W1	Delineated	Forested	0.03	0.03
	Turbine 18BR	Field Observation	Non-Forested	0	0.00
	Turbine 19	Mapped (NWI)	Forested (PUBHh)	0.03	0.01
	Turbine 22	Mapped (NWI)	Forested (PSS1E)	0.27	0.17
	Turbine 22	Field Observation	Non-Forested	0.04	0.04
	Turbine 30	Field Observation	Non-Forested	0	
	Turbine 32	Field Observation	Forested	0.01	0.01
	Turbine 34	Field Observation	Forested	0	0.00
	Turbine 40	Field Observation	Forested	0.03	0.02
	Turbine 40	Field Observation	Non-Forested	0	0.0
	Turbine 43	Field Observation	Forested	0.11	0.11
	Turbine 44R	Mapped (NWI)	Forested (PEM5E)	0.09	0.06
	Turbine 44R	Mapped (NWI)	Forested (PFO1E)	0.25	0.16
	Turbine 44R	Field Observation	Forested	0.39	0.31
	Turbine 46	Field Observation	Forested	0.18	0.11
	Turbine 49A	Field Observation	Forested	0.07	0.07
	Turbine 49B	Field Observation	Forested	0.03	0.03
	Turbine 91R	Field Observation	Non-Forested	0.05	0.05
Interconnect Overhead					
	Turbine 42	Field Observation	Forested	0	0
Interconnect Underground					
	Turbine 19	Mapped (NWI)	Forested (PUBHh)	0.05	0
	Turbine 22	Mapped (NWI)	Forested (PSS1E)	0.07	0
	Turbine 30	Field Observation	Non-Forested	0.01	0
	Turbine 34	Field Observation	Forested	0	0
	Turbine 40	Field Observation	Forested	0.01	0
	Turbine 49A	Field Observation	Forested	0	0
Turbine					
	Turbine 2	Field Observation	Forested	0	0
	Turbine 2R	Field Observation	Forested	0.03	0.01
	Turbine 3	Field Observation	Forested	0	0
	Turbine 9	Field Observation	Non-Forested	0.13	0
	TB11-W1	Delineated	Forested	0.23	0.06
	TB11-W2	Delineated	Forested	0.01	0
	TB11-W3	Delineated	Forested	0.01	0
	Turbine 12	Field Observation	Non-Forested	0.78	0
	TB15-W1	Delineated	Forested	0.06	0

Table 2.2-5. Wetlands Crossed by the Project

Facility	Turbine ID a/	Survey Type b/	Forested / Non-Forested Cover Type	Temporary Soil Disturbance (ac)	Permanent Soil Disturbance (ac)
	Turbine 18BR	Field Observation	Non-Forested	0.04	0.01
	Turbine 22	Field Observation	Non-Forested	0.03	0
	Turbine 25	Field Observation	Forested	0.06	0
	Turbine 25	Field Observation	Non-Forested	0.03	0
	Turbine 27	Field Observation	Forested	0.04	0
	Turbine 28	Field Observation	Forested	0.05	0
	TB28-W3	Delineated	Non-Forested	0.01	0
	Turbine 30	Field Observation	Non-Forested	0.29	0
	Turbine 31	Field Observation	Non-Forested	0.07	0
	Turbine 32	Field Observation	Forested	0.19	0
	TB33-W1	Delineated	Forested	0.01	0
	Turbine 34	Field Observation	Forested	0.16	0
	Turbine 36	Field Observation	Forested	0.9	0
	Turbine 40	Field Observation	Forested	0.66	0.01
	Turbine 40	Field Observation	Non-Forested	0.03	0
	Turbine 40R	Mapped (NWI)	Forested (PUBHx)	0.06	0
	Turbine 41	Field Observation	Forested	0.45	0
	Turbine 42	Field Observation	Forested	0.09	0
	Turbine 43	Field Observation	Forested	0.65	0.02
	Turbine 43	Field Observation	Non-Forested	0.01	0
	Turbine 44	Field Observation	Forested	1.56	0.18
	Turbine 46	Field Observation	Forested	0.61	0
	Turbine 46	Field Observation	Non-Forested	0.32	0
	Turbine 47R	Field Observation	Forested	0.86	0.03
	Turbine 49A	Field Observation	Forested	0.79	0.02
	Turbine 49B	Mapped (NWI)	Forested (PFO1E)	0.1	0
	Turbine 49B	Field Observation	Forested	0.29	0.02
	TB49-W1	Delineated	Forested	0	0
	TB49-W2	Delineated	Non-Forested	0.41	0
	TB52a-W1	Delineated	Non-Forested	0.64	0
	TB57-W1	Delineated	Non-Forested	0.01	0
	Turbine 90R	Field Observation	Non-Forested	0.71	0
	Turbine 91R	Field Observation	Non-Forested	0.37	0
			Subtotal Forest	**9.54**	**1.49**
			Subtotal Nonforested	**4.02**	**0.14**
			Total	**13.56**	**1.63**

a/ For delineated wetlands, this Turbine ID includes the turbine number and specific wetland ID.
b/ Survey type is based on a field reconnaissance observation or a formal wetland delineation survey.

Table 2.2-6. Streams Crossed by the Project

Facility	Turbine / Stream ID a/	Survey Type b/	Temporary Disturbance (linear feet)	Permanent Disturbance (linear feet)
Access Roads				
	TB4-ST1	Field Observation/Delineation	335.37	255.70
	Turbine 32	Field Observation	104.32	75.47
	Turbine 41	Field Observation	48.87	47.77
	TB44-ST1	Delineation	116.66	74.94
	Turbine 46/46R	Field Observation	124.70	65.97
	Turbine 46	Field Observation	140.68	88.76
	Turbine 49A	Field Observation	45.84	45.84
	Turbine 49B	Field Observation	40.91	40.91
	Turbine 90R	Field Observation	36.17	36.17
Interconnect Overhead		n/a		
Interconnect Underground				
	Turbine 5	Field Observation	35.66	0
	Turbine 6	Field Observation	22.54	0
	Turbine 32	Field Observation	35.65	0
	Turbine 37	Field Observation	52.52	0
	Turbine 46	Field Observation	21.84	0
	Turbine 49A	Field Observation	47.16	0
Turbine				
	Turbine 2R	Field Observation	116.50	0
	TB4-ST1	Delineation	13.14	0
	Turbine 6	Field Observation	197.81	0
	TB10-ST1	Delineation	360.89	0
	Turbine 13	Field Observation	285.08	0
	Turbine 25	Field Observation	232.49	0
	Turbine 28	Field Observation	72.21	0
	Turbine 30	Field Observation	74.64	0
	Turbine 32	Field Observation	510.74	0
	TB33-ST1	Delineation	224.32	0
	Turbine 34	Field Observation	511.08	0
	Turbine 36	Field Observation	295.78	0
	Turbine 37	Field Observation	816.32	93.09
	Turbine 40	Field Observation	113.34	0
	Turbine 41	Field Observation	511.46	0
	TB44-ST1	Delineation	584.18	0
	Turbine 46/46R	Field Observation	606.19	0
	Turbine 46R	Field Observation	208.49	93.73
	Turbine 47R	Field Observation	112.18	0
	Turbine 49A	Field Observation	460.43	0
	Turbine 49B	Field Observation	180.04	0
	Turbine 90R	Field Observation	80.20	0
	Turbine 91R	Field Observation	142.97	0
		Total	**7919.37**	**918.35**

a/ For delineated stream, this Turbine ID includes the turbine number and specific stream ID.
b/ Survey type is based on a field reconnaissance observation or a formal wetland delineation survey.

Groundwater

Based on the small amount of increased impervious surface area that would be created by Project development relative to the large size of the Project Area and the large distances between Project components, the Project is anticipated to have minimal impacts to regional groundwater recharge. Potential minor, localized impacts to groundwater may occur due to various construction activities necessary to the development of the Project. Turbine foundations may cause minor groundwater chemical composition alterations due to establishing concrete bases and local interruptions to natural groundwater flow patterns downgradient of turbines. Dewatering of foundation holes may also result in minor and local lowering of the water table, which could impact proximate water wells. Given the minor and highly localized character of these impacts, local water supply wells would not be adversely affected.

A water supply well inventory will be conducted prior to construction and included in the FEIS to ensure that damage to such wells, most of which are expected to be in close proximity to residences and thus distant from turbines, access roads and collection lines, will be avoided during construction. The greatest potential impacts to groundwater resulting from Project disturbances may result from developing the foundations of the turbines. Each turbine would be located a minimal distance of 1,200 feet away from existing residential structures, thereby minimizing the risk of impacts to private wells in the area, which are assumed to be located in proximity to the structures they serve. Development of the turbine foundations may require subsurface blasting, which could potentially fracture bedrock and affect groundwater and the water table in the immediate vicinity of the disturbance. These disturbances would be localized and groundwater is anticipated to resume its natural course of flow downgradient of the foundation. It may be necessary to pump out any accumulated groundwater in the excavation during construction. All dewatering of the excavation would be discharged into the surrounding surface and allowed to infiltrate back into the ground.

Additional construction activities would have minimal impacts to groundwater. In some areas, backfilled collection system trenches could promote the flow of shallow groundwater to follow the course of the trench. Any construction activities resulting in the fill of wetlands or the compaction of surfaces may cause minor and localized decreases to groundwater recharge. The operation of mechanical equipment may also pose a small risk of discharging pollutants, such as petroleum products due to leaks or spills, into the groundwater supply.

2.2.2.2 Operation

Surface Waters and Wetlands

The routine operation and maintenance of the Project facilities is anticipated to have no significant impacts to wetlands and waterbodies, as most of the Project impacts are attributed to the construction phase. Operational actions which may have an impact on wetlands include routine maintenance or emergency repairs to underground collection systems and other Project components located in or adjacent to wetlands, culvert maintenance, access road repairs,

and/or accidental fuel spills. Unforeseen equipment failures may require the use of large equipment for repairs, in which permits for the action and subsequent affects may be required.

Permanent impacts to surface waters and wetlands (loss of surface water/wetland acreage) would result from the placement of fill material to construct permanent access roads for long-term maintenance and operation activities. Other long-term impacts to wetlands would result from clearing activities (e.g., brush-hogging underground collection systems) in forested wetlands that would not result in a net loss of wetland acreage, but would result in the conversion of forested wetlands into wetland systems dominated by shrub and herbaceous vegetation (scrub-shrub/wet meadow/emergent).

Groundwater

The routine operation and maintenance of the Project facilities is anticipated to have no significant impacts to groundwater, as most of the Project impacts are attributed to the construction phase. As previously discussed, minor additional impervious surface areas due to the Project are not anticipated to have any significant impacts to regional hydrology such as groundwater recharge. Shallow groundwater flow rates and patterns may exhibit inconsequential deviations from pre-construction conditions in the immediate area surrounding the foundations of turbines and meteorological towers. Shallow groundwater flow may also deviate slightly from original directional flows where groundwater encounters backfilled trenches.

2.2.3 Mitigation Measures

The Project has been designed to avoid and minimize wetland impacts to the greatest extent practicable. As the Project design is revised into completion, additional opportunities to avoid and minimize impacts to wetlands and waterbodies will be pursued and implemented. Continued correspondence with environmental regulatory agencies throughout Project development may identify additional opportunities to avoid and reduce impacts to wetlands. Potential actions to further reduce impacts to wetlands and waterbodies may include modifying the locations of Project components and using directional drilling beneath wetlands recognized to be sensitive or of high value. To mitigate for unavoidable permanent impacts to wetlands and waterbodies resulting from Project development and operations, the Applicant would pursue adequate compensatory mitigation, as discussed in Section 2.2.4, likely through the replication or restoration of comparable in-kind wetland environments a ratio of 2 to 1 (mitigation to impact) for forested wetlands, 1.5 to 1 for scrub-shrub wetland, and 1 to 1 for emergent wetlands. The final establishment of mitigation for unavoidable permanent wetland impacts would be determined through the permitting process with the NYSDEC and USACE. Wetland impact mitigation would be commensurate with the final quantification of permanent wetland impacts once that has been determined.

Impacts to streams and wetlands will be avoided and minimized through crossing waterbodies in the fewest locations practicable and giving preference to existing crossings or narrow crossings. Establishing defined crossings and improvement of existing crossings would discourage equipment from entering prohibited wetland areas. Work spaces through wetlands would be reduced to the minimum necessary to complete the work wherever practicable; this may necessitate additional temporary workspaces beyond the limits of the wetland or waterbody to accommodate segregated soil stockpiles, Project equipment, etc. Impacts to water quality, aquatic organisms, and hydrology would be minimized through establishing restrictions to herbicide use, implementing sediment and erosion controls, using low impact crossing techniques, and restricting specific equipment from use in wetlands. Thinning of vegetation in wetlands would be performed at the least amount necessary for safe task completion. Best Management Practices (BMP) recommended by the NYSDEC and USACE and established in the wetland permits conditions would be implemented where wetland and waterbody disturbance is necessary.

Mitigation measures implemented to protect wetlands and waterbodies would include establishing “No Equipment Access Areas” and “Restricted Activities Areas.” All wetlands and waterbodies will be designated as No Equipment Access Areas, except where defined crossings are established or work in wetlands is permissible under the conditions of the wetlands permits. The designation of No Equipment Access Area would forbid the use of machinery or motorized equipment from these areas. Designated Restricted Activities Areas would limit the extent of permissible activities within an established buffer zone of 100 feet surrounding essential construction activities within wetlands and waterbodies. Restricted activities in these areas would include the following:

- No degradation of stream banks;
- No storage of construction debris within the area;
- No equipment refueling or washing within the area;
- Limited use and strict adherence to manufacturer’s instructions for the application of herbicides;
- No storage of any chemical substances, combustible fuels, or petroleum products within the area; and
- No deposition of slash within or adjacent to a wetland or waterbody.

Where access to wetlands is necessary, construction activities would use methods of least potential impact where possible, such as identifying and using higher ground and edges, crossing wetlands at the narrowest crossing point, and using timber mats. Culverts would be installed where permanent stream crossings are developed. Culverts would be designed to maintain the natural flow of water on both the upgradient and downgradient side of the stream. The Applicant would comply with any stream crossing restrictions imposed under permit

conditions, such as possible seasonal restrictions and/or alternative stream crossing techniques.

The Project does not anticipate any adverse impacts to wetlands attributed to modified stormwater drainage, as the increase of impervious area is minimal. However, potential stormwater related impacts to wetlands would be addressed and mitigated for in the Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will be included in the FEIS. It will include provisions to identify the need for measures such as temporary sediment retention basins, water bars, culverts, and/or trenches to manage drainage problems. Sediment and erosion control devices could include the use of silt fencing, hay bales, and siltation basins, among others. Potential impacts to wetlands and surface waters from the possible release of hazardous substances would be addressed and mitigated for in the SPCC Plan. The SPCC Plan will outline mandatory BMPs that the Project will implement to prevent and minimize potential impacts to wetlands and waterbodies in the event of an accidental hazardous substance spill. This plan designates Project personnel who are required to be notified in the event of a spill and provides contact information. The only petroleum products, hazardous, or controlled substances anticipated for use on-site during Project construction and operation will be small quantities of equipment oils and lubricants. Gasoline, diesel fuel, and fertilizer will not be stored in construction work areas.

As previously stated, impacts to groundwater are not anticipated. In the event that blasting is necessary, a blasting plan would be prepared and submitted to the Town that would be designed and implemented to keep the impacts localized. A groundwater well survey will be conducted prior to the FEIS to determine the location and proximity of any known wells to any potential blasting site.